THE NEW INDIAN EXPRESS

BENGALURU • THURSDAY • AUGUST 24, 2023 • ₹9.00 • PAGES 22 • LATE CITY EDITION

READ **SHARE** FOLLOW
newindianexpress.com

• CHENNAI • MADURAI • VIJAYAWADA
• BENGALURU • KOCHI • HYDERABAD
• VISAKHAPATNAM • COIMBATORE
• KOZHIKODE • THIRUVANANTHAPURAM
• BELAGAVI • BHUBANESWAR • SHIVAMOGGA
• MANGALURU • TIRUPATI • TIRUCHY
• TIRUNELVELI • SAMBALPUR • HUBBALLI
• DHARMAPURI • KOTTAYAM • KANNUR
• VILLUPURAM • KOLLAM
• TADEPALLIGUDEM • NAGAPATTINAM
• THRISSUR • KALABURAGI

INDIA OVER THE MOON

FIRST COUNTRY TO REACH THE LUNAR SOUTH POLE • FOURTH NATION AFTER RUSSIA, THE U.S., AND CHINA TO SUCCESSFULLY LAND ON MOON • FLAWLESS TOUCHDOWN AT 6.04 PM • LANDING PROCESS LASTED 17 MINUTES

This is a moment to cherish. India is now on the Moon and now is the time to walk on the 'Chandra Path'. We are witness to the flight of new India. New history has been written. India is proving again and again that the sky is not the limit

Narendra Modi, PM

Most of those who were with Chandrayaan-2 are with us for Chandrayaan-3. They have gone through such agony...The technology in Chandrayaan-3 is no less complex or inferior to any other technology that goes to the Moon

S Somanath, ISRO chief

This is a big step forward in space exploration and a testament to the impressive progress made by India in the area of science and technology. Congratulations and best wishes for the new achievements

Vladimir Putin, Russian president

BALA CHAUHAN & PURAN CHAUDHARY @ Bengaluru

INDIA on Wednesday scripted history in golden letters after recording the first-ever landing at the Moon's south pole. With this landing, exactly at 6.04 pm, India also became only the fourth country to have soft-landed on the lunar surface after the US, the erstwhile Soviet Union, and China.

Chandrayaan-3's record-setting success comes four days after Russia's lunar mission Luna-25 crashed on August 19, just two days before its scheduled touchdown near the lunar south pole attempting to be the first to do so. That record now lies with Chandrayaan-3 of the Indian Space Research Organisation (ISRO).

The Chandrayaan-3's lander Vikram began its powered descent at 5.47 pm from an altitude of 30 km. It completed all the four landing phases of rough braking, altitude hold, fine braking and terminal descent in an error-free manner, as planned and sticking to their respective deadlines. The powered descent of Vikram Lander lasted 17 minutes, filled with tension as it was during this phase that Chandrayaan-2 had lost its lander in September 2019. "Chandrayaan-3 chose a relatively flat region on the lunar surface," Isro wrote on micro-blogging site X (formerly Twitter). It touched down between Manzinus C and Simpelius N craters near the lunar south pole.

Agony and ecstasy

The entire community of ISRO scientists, including some former ISRO heads who had gathered at the Mission Operations Complex (MOX) at ISRO Telemetry, Tracking and Command Network (ISTRAC) in Bengaluru, exulted in jubilation as Vikram landed. "Sir, we have achieved a soft landing on the Moon. India is on the Moon," said an overwhelmed ISRO chairman S Somanath, seconds after lander Vikram touched down on the Moon while addressing Prime Minister Narendra Modi, who virtually joined to witness the historic moment from South Africa where he is attending the BRICS Summit.

The thunderous applause echoed from inside the MOX and merged with the resounding applause at the press enclave at ISTRAC premises amid loud cheers of *Bharat Mata ki Jai* and *Vande Mataram*.

The scientists inside MOX, who had watched the tense moments of 'terror' of the lander's power descent after the last command from the Earth station at 5.47 pm, broke out into a thunderous applause. It was a complete meltdown of emotions, perseverance, a lot of hard work and celebrations.

Beginning of multiple space explorations

ISRO chief Somanath said Chandrayaan-3's success means a lot to ISRO and marks the beginning of multiple space explorations starting with 'Aditya L1' to study the corona of the Sun early next month. ISRO aims to explore Mars, Venus and other planets and asteroids, he added

"It was a flawless mission," said Somnath while describing the mission so far until the soft-landing was achieved. He described it as "an incremental progress" while crediting the preceding mission, Chandrayaan-2, which failed to achieve a successful soft-landing due to an anomaly in the thrusters while attempting to land on September 7, 2019, leading to its crash. Chandrayaan-3 is an improvement on Chandrayaan-2 while its objectives remain the same.

"It was not an easy task in the last four years. There was a lot of agony and learning from Chandrayaan-2, which helped us in perfecting the methodology for soft-landing. It was a flawless landing. The velocity (of the lander) was reduced to less than two metres per second (during the power descent)," he said.

Somanath named and invited the scientists behind Chandrayaan-3 — project director P Veeramuthuvel, mission operation director M Srikanth, associate project director K Kalpana, and U R Rao Satellite Centre director M Sankaran — to address the media.

Several missions from various countries, including India, Russia, Japan, and Israel have attempted landing near the lunar south pole but failed.

Why south pole

The significance of the lunar south pole is that it holds promise for setting up future human bases. While the region has been screened from orbit by various orbiting missions, including Chandrayaan-2, which continues to be in a lunar orbit, none has been able to land to conduct on-site experiments and studies of the lunar environment at and around the Moon's south pole. The region is understood to be holding abundant water ice and mineral resources that can sustain human bases in future.

Vikram will deploy its rover Pragyaan to conduct on-site studies. Somanath said Pragyaan will be deployed from the lander in the "next few hours or even a day, looking at the surface conditions. It will operate on the lunar surface for 14 Earth days and gather valuable scientific data", which would be relayed back to the Deep Space Network centre at Byalalu near Bengaluru for analysis. The lander's mission is planned to be over 14 days (one lunar day), during which the lander's three payloads and the rover's two payloads will be active to conduct the studies of the lunar environment.

Explaining the various components used in the Moon mission, he said all of them were developed in the country. He added that the lander does have some instruments provided by some countries to conduct tests on the Moon surface. P5,8

MOON WALK

Chandrayaan-3's Vikram Lander is the first successful mission for India and globally the 11th successful unmanned mission. There were six other successful manned missions on the Moon

ROBOTIC TOUCHDOWN

	SPACECRAFT	COUNTRY	LAUNCH DATE	MOON LANDING
1966	Luna 9	USSR	Jan 31, 1966	Feb 3, 1966
1967	Surveyor 1	USA	May 30, 1966	June 2, 1966
	Luna 13	USSR	Dec 21, 1966	Dec 24, 1966
1968	Surveyor 3	USA	April 17, 1967	April 20, 1967
	Surveyor 5	USA	Sept 8, 1967	Sept 11, 1967
1969	Surveyor 6	USA	Nov 7, 1967	Nov 10, 1967
	Surveyor 7	USA	Jan 7, 1968	Jan 10, 1968
1970	Luna 17	USSR	Nov 10, 1970	Nov 17, 1970
	Delivered Lunokhod 1 rover to the surface of the Moon			
1971	Chang'e 3	China	Dec 6, 2013	Dec 14, 2013
	Delivered Yutu rover to lunar surface			
1972	Chang'e 4	China	Dec 7, 2018	Jan 03, 2019
	Delivered Yutu 2 Rover. First lunar farside landing			
2013				
2019				

HUMAN LANDING

Apollo 11	USA	July 16, 1969	July 20, 1969
First humans to land on the Moon			
Apollo 12	USA	Nov 14, 1969	Nov 17, 1969
Rendezvous with Surveyor 3 on the surface of the Moon			
Apollo 14	USA	Jan 31, 1971	Feb 4, 1971
Crew landed on the lunar highlands			
Apollo 15	USA	July 26, 1971	July 29, 1971
Ninth Apollo crewed mission and the fourth to land on the Moon. It used a Lunar Roving Vehicle			
Apollo 16	USA	April 16, 1972	April 19, 1972
Landing and exploration in an area which scientists believed was formed by volcanic action			
Apollo 17	USA	Dec 7, 1972	Dec 20, 1972
Final human mission to the Moon			

5-watt signal amplifier

Chandrayaan-3 is the product of team work with several scientists, technicians, entrepreneurs among others joining hands to make it a success. Isro's associate director Dr B H M Darukesha and his team had developed a 5-watt signal amplifier for communication — an important part of Chandrayaan-3's lander and rover — when no other country came forward to provide it to India since amplifiers are mostly used by the military | P9

Rover's desi cameras

The Pragyaan rover has two cameras which would be its eyes compared to foreign space agencies that use expensive cameras. The software in the rover has been developed by a Noida-based start-up, Omnipresent Robot Technologies. The images captured by the rover would generate a 3-D map of the lunar landscape. It also has a spectrometer to determine the chemical composition of the surface

TIE-BREAK

TO DECIDE WORLD CUP WINNER

R Praggnanandhaa drew the second classical game of the final of the FIDE Chess World Cup against World No 1 Magnus Carlsen. The finalists called it a draw after 30 moves | P17

Board exams twice a year, students can retain higher score

KAVITA BAJELI-DATT @ New Delhi

FROM the next academic year, board examinations for classes 10 and 12 will be held twice a year and students can retain the higher score, Union education minister Dharmendra Pradhan said on Wednesday as he launched the new curriculum framework for schools in sync with the National Education Policy 2020. Under the new framework, students in classes 9 and 10 will study three languages, of which two will be Indian, while class 11 and 12 students will study two languages including one Indian. Currently, class 9 and 10 students have to study two mandatory languages while class 11 and 12 students have only one.

Students will now have more combinations of subjects while choosing their stream. Another highlight of the framework is the reduced content load in each subject to make space for critical thinking and holistic learning.

Pradhan said India has to live up to global expectations and has to "develop technology-driven educational system that meets expectations of the world's community alongside India".

MAKING A POINT

Prime Minister Narendra Modi addresses the Open Plenary Session of BRICS Summit, in Johannesburg, South Africa, on Wednesday | PTI | REPORT: P9

60% of BBMP buildings lack fire safety systems

MOHAMMED YACOOB @ Bengaluru

THE Bruhat Bengaluru Mahanagara Palike's (BBMP) quality control laboratory did not have a fire safety system as per National Building Code (NBC) norms at the time of the blaze there 13 days ago, according to sources. Nine staff members working at the laboratory suffered burns in the blaze.

As per NBC norms, all buildings with three or more floors and laboratories, where tests and experiments are done, should have "fire escape staircases". But the Palike's laboratory did not have such a staircase, the sources said.

They said over 60% of Palike's buildings across the city are without such staircases. The laboratory was not fully equipped with fire extinguishers when the fire broke out. Fire extinguishers had to be rushed from elsewhere to douse the blaze.

"The Palike's building lacks a fully operational fire fighting system. As per my knowledge, even the mandatory 'No Objection Certificate' from the fire and emergency services was not obtained for the quality control laboratory," a senior official from BBMP headquarters said.

The sources said the civic body's engineers are yet to appear before the police officers investigating the case with documents which they had sought. CONTINUED ON: P2

EXPRESS READ

Mathematician Dr CR Rao passes away at 102

Visakhapatnam: Renowned mathematician and statistician

Calyampudi Radhakrishna Rao, popularly known as Dr CR Rao, passed away in the United States on Wednesday. He was 102. Rao achieved worldwide fame for his contributions to statistics | P5

Wagner chief said to be among dead in jet crash

Moscow: A private jet crashed in Russia on Wednesday, killing all 10 people on board. Mercenary chief Yevgeny Prigozhin was on the passenger list, but it wasn't immediately clear if he was on board. Media reports said the jet belonged to Prigozhin, founder of the Wagner military company

Pre-2019 vehicles must have high-security number plates by Nov 17

AKNISREE KARTHIK @ Bengaluru

ALL vehicles registered in the state before April 1, 2019, should have High-Security Registration Plates (HSRP) by November 17.

A circular issued by the transport department stated that failure to adhere to this order aimed at standardising registration plates of all vehicles across the country to put an end to tampering with number plates to commit crimes, will attract fines up to Rs 1,000 and action against errant vehicle owners. Affixation of HSRP on old vehicles will be done by authorised dealers of original equipment manufacturers (OEMs), the circular issued on August 18 stated.

Vehicle owners will be asked to book appointments to fix the new number plates and make payments for the same through the portals authorized by OEMs. Through the portals, vehicle owners can select the nearest dealer and date to get the number plates fixed as per their convenience. OEMs or their dealers should display the fees for the number plates at their showrooms and for registration on the HSRP portal.

The authorised HSRP manufacturers should ensure that they upload the photograph of the number plate on the HSRP portal and ensure that the laser code is updated on VAHAN portal. Legal action will be initiated against those selling and supplying HSRP without the permission of OEMs. Owners of vehicles who have fixed imitation of HSRP or look alike plates should go for authorised HSRP to avoid penalty, the circular stated.

Transport officials said there were nearly two crore vehicles in the state registered before 2019. Transfer of ownership of vehicles, address change, issue of duplicate RCs and fitness certificates, renewal of insurance policies, etc., will be allowed only after HSRP validation. Awareness among vehicle owners to fall in line will be created. The cost of HSRP for two-wheelers is expected to be around Rs 300 and for four-wheelers around Rs 500.